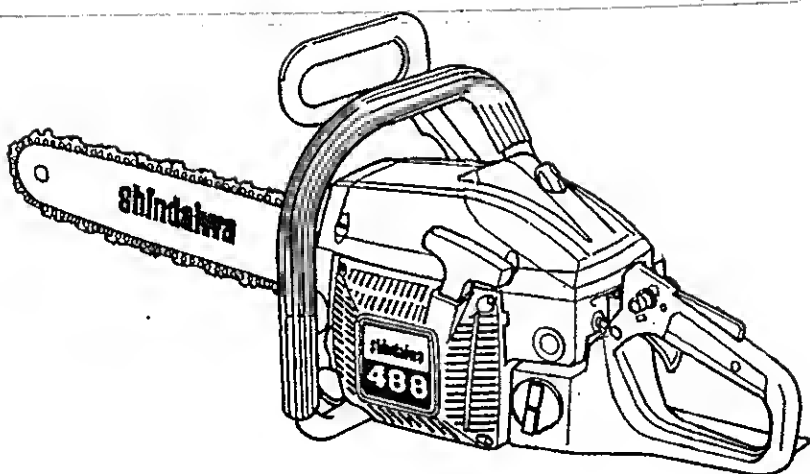




OWNER'S MANUAL

SHINDAIWA MODEL 488 CHAIN SAW



shindaiwa



WARNING!

Always wear eye protection when operating this machine! To minimize the risk of injury, read and follow this manual and familiarize yourself with its contents. Your Shindaiwa 488/488P chain saw is equipped with a spark arrester muffler. Do not run the machine without the spark arrester screen in place.

This engine meets U.S. EPA PHASE 1 emission regulations for utility and lawn and garden equipment. This engine is certified to operate on a 40:1 mixture consisting of unleaded gasoline and 2-cycle engine mixing oil only. Please refer to this manual for all maintenance specifications and adjustments.

INTRODUCTION

This Shindaiwa 488 saw was designed and built to deliver superior performance and reliability without compromise to quality, comfort, safety, or durability.

Shindaiwa high performance engines represent the leading edge of 2-cycle engine technology, and deliver exceptionally high power at remarkably low displacement and weight. As a professional owner/operator, you'll soon discover why Shindaiwa is simply in a class by itself!

IMPORTANT!

The information contained in this manual describes machines available at the time of production. While every attempt has been made to give you the very latest information about your Shindaiwa 488 chain saw, there may be some differences between your saw and what is described here. Shindaiwa Inc. reserves the right to make changes in production without prior notice, and without obligation to make alterations to machines previously manufactured.



WARNING!

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

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This symbol on the nameplate means this saw is listed by Underwriters Laboratories Inc.

ATTENTION STATEMENTS

This manual contains special "attention statements" surrounded by boxes and preceded by the triangular Attention Symbol.



WARNING!

A statement preceded by the word "WARNING" contains information that should be acted upon to prevent serious bodily injury.



CAUTION!

A statement preceded by the word "CAUTION" contains information that should be acted upon to prevent damaging your saw.

Additional attention statements that are not preceded by the Attention Symbol are:

IMPORTANT!

A statement preceded by the word "IMPORTANT" is one that possesses special significance.

NOTE:

A statement preceded by the word "NOTE" contains information that is handy to know and may make your job easier.

All chain saw service, other than the items listed in the owner's manual maintenance instructions, should be performed by trained Shindaiwa chain saw service personnel. (For example, if improper tools are used to remove the flywheel or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur and could subsequently cause the flywheel to burst.)



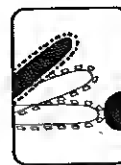
Read and follow the Operator's Manual. Failure to do so could result in serious injury.



Wear eye and hearing protection at all times during the operation of this unit.



Do not operate this tool if you are tired, ill or under the influence of alcohol, drugs, or medicine.



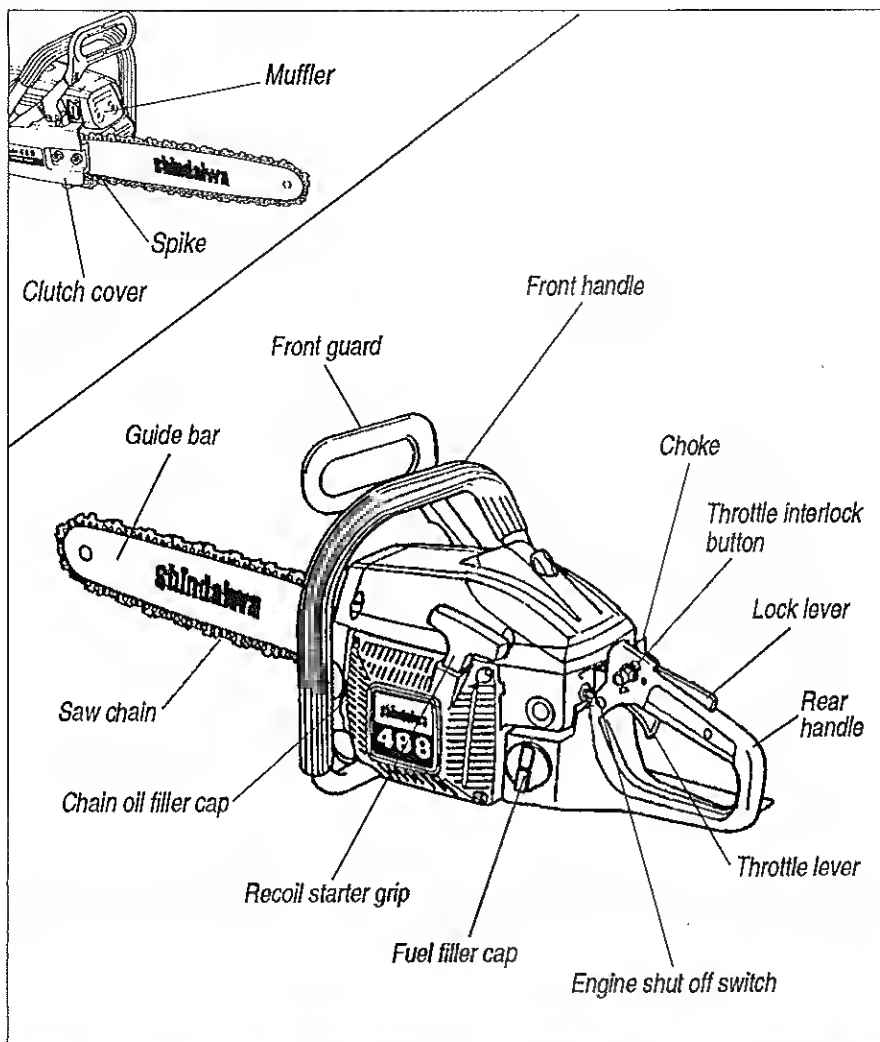
Beware of Kickback!

Kickback can occur whenever the tip of the guide bar touches an object while the saw is operating. Kickback may force the bar up and back toward the operator with a lightning-fast reaction!



Pinching the saw along the top of the guide bar may force the bar rapidly back toward the operator. Pinching can occur whenever wood closes in around the moving chain.

NOMENCLATURE

**IMPORTANT!**

The operational procedures described in this manual are intended to help you get the most from your machine and also to protect you and others from harm. These procedures are general guidelines only, and are not intended to replace any additional safety rules or laws that may be in force in your area. If you have any questions regarding

your Shindaiwa chain saw, or if you do not understand something in this manual, your Shindaiwa dealer will be glad to assist you.

For additional information, you may also contact Shindaiwa Inc. at the address printed on the back of this manual.

SPECIFICATIONS*

Model.....	488
Engine Type.....	2-cycle, air cooled gas engine
Displacement.....	47.9cc (43x33) (2.92 cu. in.)
Fuel.....	Gasoline/oil mixture, 40:1 with Shindaiwa Premium 2-cycle engine oil
Carburetor.....	Diaphragm (Walbro) HDA165
Ignition.....	CDI (Capacitor Discharge Ignition system)
Spark Plug.....	Champion CJ6Y
Starting.....	Recoil starter
Stopping.....	Grounding (Toggle switch)
Power Transmission.....	Automatic centrifugal clutch
Chain Lubrication.....	Automatic adjustable oiler
Chain.....	.325" pitch, .050" gauge
Chain Oil.....	Shindaiwa Premium Bar & Chain Oil (or equivalent)
Fuel Tank Capacity.....	0.60 liter (20.2 oz.)
Oil Tank Capacity.....	0.30 liter (10.1 oz.)
Handle.....	Special anti-vibration handles (front and rear handles, independently vibration dampened)
Safety Devices.....	Front guard, rear guard, throttle lock, chain stop, chain brake and chain catcher
Weight (less bar and chain).....	4.6kg (10.2 lbs.)

*Specifications subject to change without notice.

Tools included

- Screwdriver
- Spark plug/13mm socket wrench



WARNING!

Do not make unauthorized modifications to this saw, guide bar, or chain!

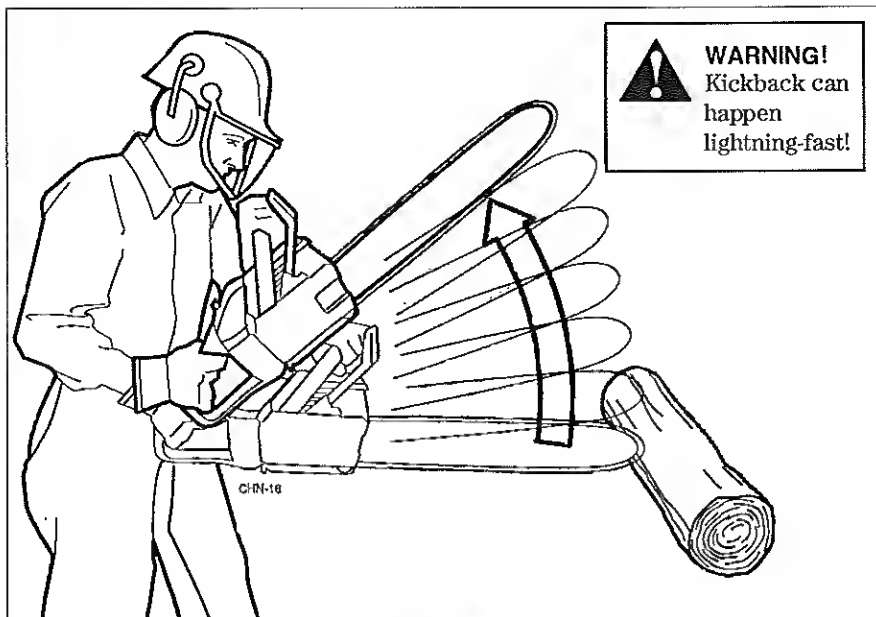
RECOMMENDED BAR AND CHAIN COMBINATIONS

	Oregon®	Oregon®	Oregon®
488:	Chain Type 33SL (16")	33SL (18")	33SL (20")
	Guide Bar 16" Double-Guard Sprocket Nose Bar	18" Double-Guard Sprocket Nose Bar	20" Double-Guard Sprocket Nose Bar



Replacement chain for this saw must meet applicable ANSI B175.1 kickback performance requirements and/or be designated as "low kickback chain" per ANSI B175.1-1991 standards.

KICKBACK SAFETY



This saw is equipped with the following safety equipment:

1. Manual chain brake.
2. Low kick chain.
3. Guard-tip bar.

■ Activating the chain brake tightens a brake band around the chain drive mechanism, stopping all chain rotation. The chain brake can be activated manually, and is also designed to activate when kickback energy forces the brake lever against the operator's left hand.

■ Low-kick chain that can significantly reduce the rotational force of kickback.

■ A Guard-Tip Bar manufactured with a reduced-radius (smaller) nose. This special guide bar can reduce kickback by placing fewer cutters in the kickback zone.



WARNING!

To reduce the risk of kickback, all of the above devices must be properly installed and in good repair! Use of other than ANSI B175.1 combinations may result in reduced kickback protection!



WARNING!

Brake engagement and operation depend upon proper adjustment! For proper chain brake testing and adjustment procedures, see page 18.

KICKBACK SAFETY PRECAUTIONS



WARNING!

Either of the following reactions could cause you to lose control of your saw while cutting, possibly resulting in serious injury!

1. Kickback may occur whenever the nose or tip of the guide bar touches an object, or when the wood closes in and pinches the saw chain in the cut. Tip contact in some cases may cause a lightning-fast reverse reaction, kicking the guide bar up and back towards the operator.

2. Pinching the saw chain along the top of the guide bar may push the guide bar rapidly back toward the operator!

Either of these reactions may cause you to lose control of the saw, which could result in serious personal injury.

Do not rely exclusively upon the safety devices built into your saw! As a chain saw user, you should take several steps to keep your cutting jobs free from accident or injury:

1. With a basic understanding of kickback, you can reduce or eliminate the element of surprise. Sudden surprise contributes to accidents!
2. Keep a firm grip on the saw with both hands, the right hand on the rear handle, and the left hand on the front handle, whenever

the engine is running. Use a firm grip with thumbs and fingers encircling the chain saw handles. A firm grip will help you to reduce kickback and maintain control of the saw.

3. Make sure that the area in which you are cutting is free from obstructions. Do not let the nose of the guide bar contact a log, branch, or any other obstructions which could be hit while you are operating the saw.

4. Cut at high engine speeds.

5. Do not overreach or attempt to cut above shoulder height!

6. Follow the manufacture's instructions for sharpening and maintenance of the saw chain.

7. Use only the replacement bars and chains or equivalent as specified by the manufacturer.

8. Use low-kickback chain, chain brakes, or special guide bars to reduce the risk of kickback. Low kickback chain is chain that has met the kickback performance requirements of ANSI B175.1-1991 (American National Standard for Power Tools-Gasoline Powered Chain Saws-Safety requirements) when tested on the representative sample of chain saws below 3.8 c.i.d. specified in ANSI B175.1-1991.

ADDITIONAL SAFETY PRECAUTIONS



WARNING!

NOTE:

These safety precautions are intended primarily for the consumer or occasional user. When using this chain saw for logging purposes, refer to: CFR Section 1910. 266 (5); 2.5.1 of the American National Safety Standard; Requirements for Pulpwood Logging ANSI 03.1-1978; and any applicable state safety codes.

IMPORTANT!

Read this manual carefully before operating your new Shindaiwa chain saw. The following safety precautions should be observed by all users of chain saws:

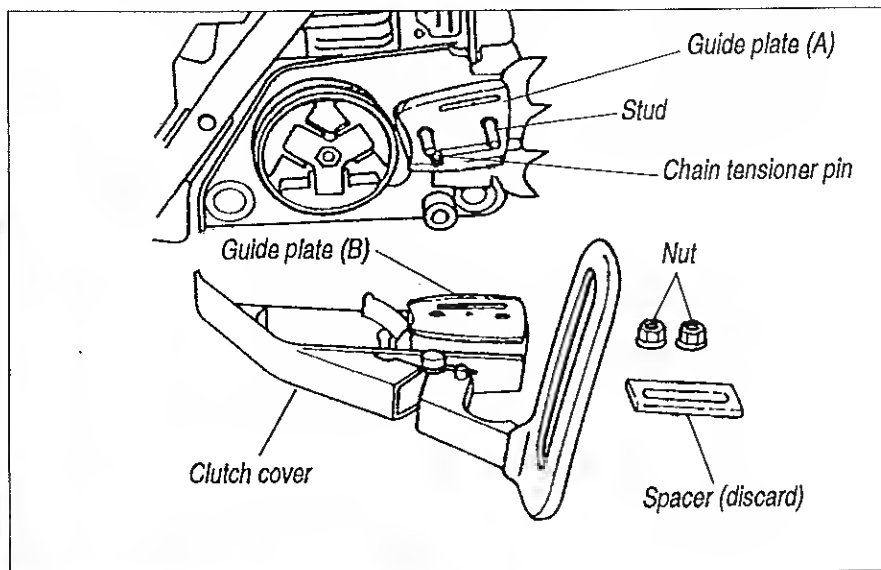
1. Do not operate a chain saw when you are fatigued.
2. Use safety footwear, snug-fitting clothing, protective gloves, eye, hearing and head protection devices.
3. Use caution when handling fuels. Move the saw at least 10 feet (3 meters) from the fueling point before starting the engine.
4. Do not begin cutting until you have a clear work area, secure footing, and a planned retreat path from the falling tree.
5. Before you start the engine, make sure the saw chain is not contacting anything.
6. Carry the chain saw with the engine stopped, the guide bar and saw chain to the rear, and the muffler away from your body.
7. Keep the saw chain sharp and properly adjusted.
8. Never allow young children or any person unfamiliar with chain saws to operate this saw.
9. When repairing or servicing this saw, use only genuine Shindaiwa replacement parts.
10. Do not operate this or any other chain saw with the muffler removed.
11. Never allow other persons to be near the chain saw while the saw is operating. Keep bystanders and animals out of the work area!
12. When transporting your saw, use the appropriate guide bar scabbard.
13. Keep all parts of your body away from the saw chain when the engine is running.



WARNING!

14. Do not operate a chain saw that is damaged, is improperly adjusted, or is not completely and securely assembled. Be sure the chain stops moving when the throttle trigger is released.
15. Turn the engine OFF before setting the saw down.
16. Use extreme care when cutting small brush and saplings: slender material may catch in the saw chain and be whipped toward you or pull you off balance.
17. When cutting a limb that is under tension, be alert for springback so that you will not be struck by the moving limb.
18. Operate the saw only in well-ventilated areas.
19. Never operate any chain saw in a tree unless you have been specifically trained to do so.
20. Never operate a saw that has damaged or missing anti-vibration cushions (isolators). Long-term exposure to vibration can damage your hands.
21. Wear suitable hearing protection while operating this saw. Prolonged exposure to excessive noise could damage your hearing, and is also fatiguing.
22. Keep the handles dry, clean, and free of oil or fuel mixture.
23. Never operate a chain saw with only one hand! Serious injury to the operator, helpers, bystanders, or any combination of these persons may result from one-handed operation. A chain saw is intended for two-handed use.
24. All chain saw service other than the items listed in this owners manual maintenance instructions, should be performed by competent chain saw service personnel.
(For example, if improper tools are used to remove the flywheel or if an improper tool is used to hold the flywheel in order to remove the clutch, structural damage to the flywheel could occur and subsequently cause the flywheel to burst.)
25. Improper maintenance, use of nonconforming replacement components, or the removal of safety devices, such as the chain brake or any of the chain brake components, could result in serious injury.

INSTALLING THE GUIDE BAR AND SAW CHAIN



NOTE:

For longest chain life, place new or replacement chain loops in oil and soak overnight before installation.

IMPORTANT!

The chain brake must be completely disengaged before removing or installing the clutch cover.

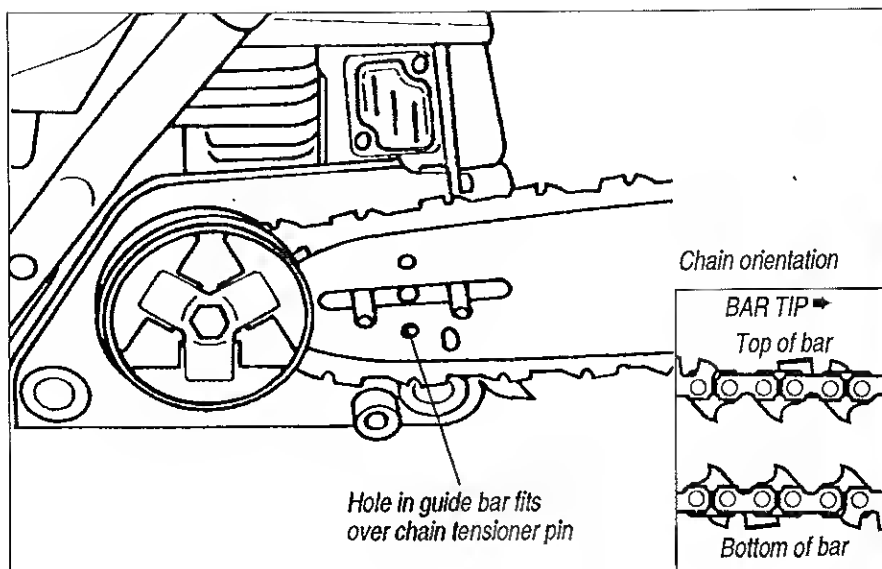
1. Use the socket wrench to remove the clutch cover nuts in a counter-clockwise rotation.
2. Remove the clutch cover.
3. Remove and discard the packing spacer.

4. Place the guide bar over the guide bar studs and chain tensioner pin.



CAUTION!

Failure to align the guide bar and chain tensioner pin can cause serious damage to the clutch cover, guide bar, tensioner pin, and/or engine crankcase!



5. Install the chain loop over the drive sprocket, and then align the chain drive links within the guide bar groove. Verify that the cutters are properly oriented, and that the chain tensioner pin is aligned as shown. If chain installation is difficult or if the chain appears too tight, refer to "Adjusting the Saw chain," (page 10)

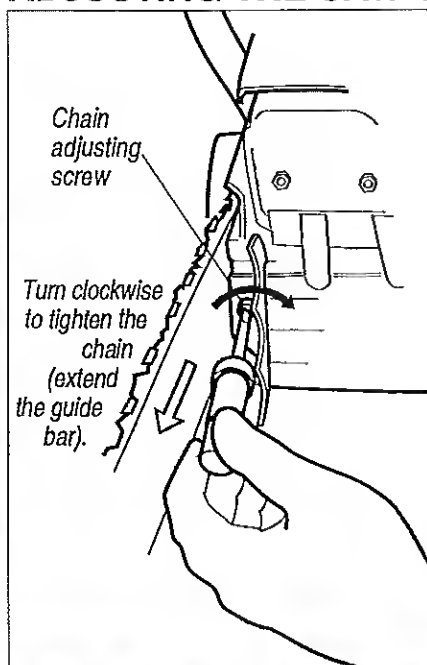


WARNING!

Never operate this saw without the clutch cover installed!

6. Install the clutch cover over the bar studs. Using finger-pressure only, install the bar nuts.

ADJUSTING THE SAW CHAIN



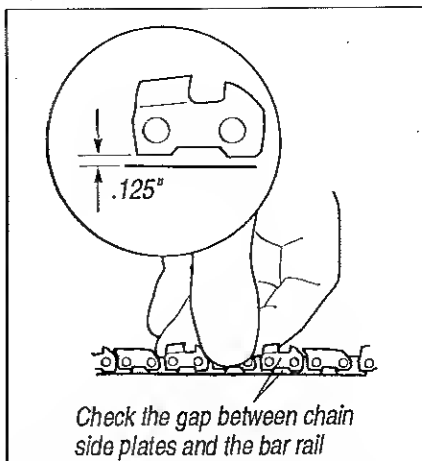
IMPORTANT!

Proper chain adjustment is essential for maximum performance, chain life, and operator safety. Always inspect chain tension before operating this saw!

1. Place the saw on a flat surface and lift the bar nose slightly.
2. To adjust chain tension:
 - Turn the chain tension screw clockwise to tighten the chain.
 - Turn the chain tension screw counter-clockwise to loosen the chain.

■ Adjusting a hard-nose guide bar (two methods):

— Tighten or loosen the adjusting screw until gently lifting the chain at mid-bar produces only a .125" (3.2mm) gap between the chain side-plates and the bar rail.



— While lifting the bar nose, tighten or loosen the adjusting screw until the chain at mid-bar on the bottom of the bar just contacts the guide bar rails.

■ Adjusting a sprocket-nose bar:

A sprocket-nose guide bar should be adjusted slightly tighter than a hard-nose bar, but must still pull freely around the bar.

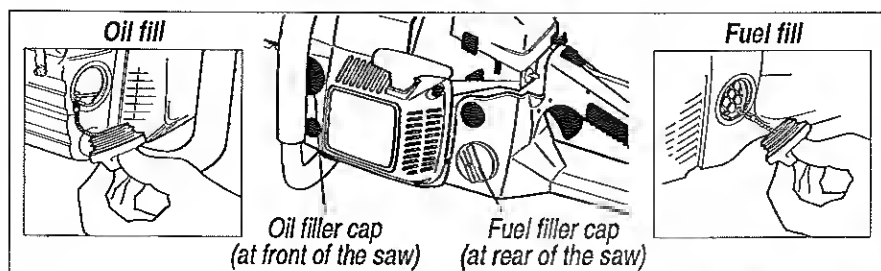
3. Tighten both bar nuts securely, and verify correct chain tension for the type of bar being used.
4. To adjust chain tension in the field:
 - Stop the saw and allow the guide bar and chain to cool.
 - Loosen both bar nuts approx. 1 turn each, and then repeat steps 1-3 above. Never operate the saw with a loose chain!



WARNING!

Inspect chain tension often during operation, especially when breaking in a new chain. A loose saw chain can cause the guide bar to unexpectedly "jump" during operation, possibly causing serious personal injury!

MIXING FUEL/FILLING WITH FUEL



Fuel Requirements:

- Use only fresh, clean fuel
- Use only fuel with an octane rating of 87 or above
- Mix all fuel with Shindaiwa Premium 2-Cycle Mixing Oil at a gasoline/oil ratio of 40:1 (3.2-ozs. mixing oil to 1-gallon gasoline).



CAUTION!

Some gasolines contain alcohol as an oxygenate! Oxygenated fuels may cause increased engine operating temperatures! Under certain conditions, alcohol-based fuels may also reduce the lubricating qualities of some mixing oils! Never use any fuel containing more than 10% alcohol by volume! When an oxygenated fuel must be used, an oxygenate such as MTBE is to be preferred over an alcohol-based fuel!



CAUTION!

Whenever possible, use Shindaiwa Premium 2-Cycle mixing oil or equivalent quality oil mixed at a 40:1 ratio. Be aware that some generic oils and some outboard mixing oils may not be intended for use in high-performance air cooled 2-cycle engines, and should never be used in your Shindaiwa saw!

IMPORTANT!

Mix only enough fuel for your immediate needs! If fuel must be stored longer than 30 days, it should first be treated with a stabilizer such as StaBil™ or equivalent product!

Filling the Fuel Tank

- Place the saw on its side (clutch cover down), and wipe any chips or debris from around the fuel cap.
- Remove the fuel cap (at the rear of the saw).
- Fill the tank with clean, fresh fuel mixed as above, and replace the cap.
- Wipe all spilled fuel before starting the saw.



CAUTION!

Minimize the risk of fire!

- Never attempt to refuel a hot saw! Always allow the saw to cool before fueling: open the fuel cap slowly to release any pressure within!
- After fueling, wipe all spilled fuel and move the saw at least 10 feet (3 meters) from the fueling point before restarting!
- Never smoke or light any fires near the saw or fuels!
- Never place flammable material close to the engine muffler!
- Never operate the saw without the muffler and spark arrestor in place and properly functioning!

BAR OIL/FILLING WITH OIL

Oil Requirements

- When available, use Shindaiwa Premium bar & chain oil.
- When Shindaiwa oil is not available, use a premium 30 weight oil specifically blended for bar & chain lubrication.
- For cold weather operation, bar oil may be thinned by mixing with clean kerosene at a ratio of 1:1.

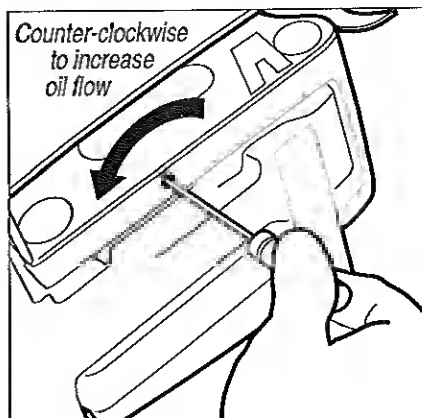
Filling the Oil Reservoir

- Place the saw on its side (clutch cover down), and wipe any chips or debris from around the oil cap.
- Remove the oil cap (at the front of the saw).
- Fill the oil reservoir with bar & chain oil, and replace the cap.
- Wipe spilled oil from handles and controls before starting the saw.



CAUTION!

Proper lubrication is critical to the performance and service life of your saw's oil pump, guide bar, and saw chain! Always use a high quality lubricating oil designed for saw chain lubrication! Never use dirty or reclaimed oil

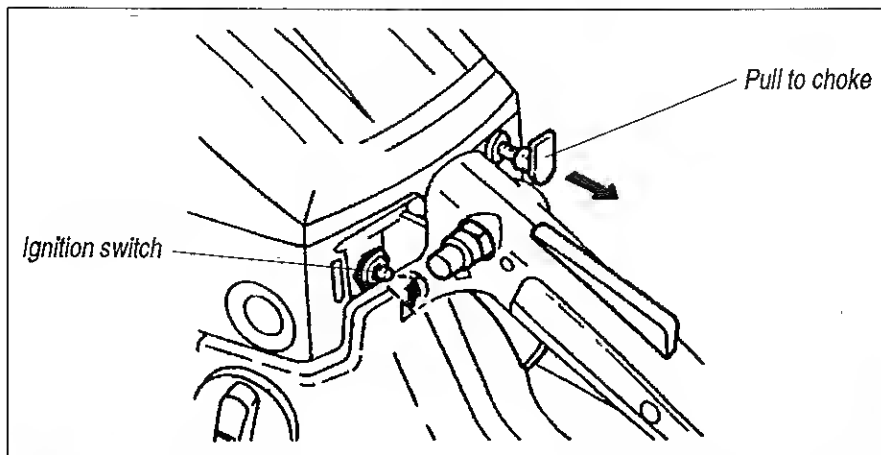


Oil Pump Adjustment

Guide bar and saw chain lubrication is automatically provided by an adjustable-rate oil pump designed to operate whenever the clutch drum rotates. A temporary increase in oil flow rate is often desirable when cutting hardwoods or large-diameter softwoods, and can be provided as follows:

1. Stop the saw, and verify that the engine stop switch is in the "OFF" position.
2. Place the saw on its side, with the clutch cover facing up.
3. Use a screwdriver to turn the oil flow rate adjustment screw.
 - Clockwise to decrease bar & chain lubrication.
 - Counter-clockwise to increase bar & chain lubrication.

STARTING AND STOPPING THE SAW



WARNING!

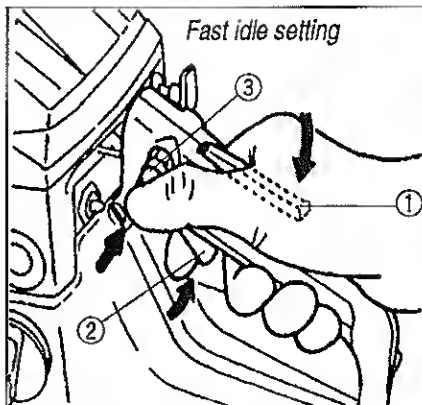
The saw chain will rotate when the saw is started! The saw chain can cause serious injury! Clear a safe work area before starting this saw!

IMPORTANT!

The engine ignition is controlled by a two-position "ON-OFF" switch located near the throttle lever on the rear handle. The ignition switch is typically labelled "I" for ON and "O" for OFF.

Control Positions (cold engine):

1. Move the ignition switch up to the "I" (ON) position.
2. Choke the engine by pulling the choke control to its fully extended position (choke is closed)
3. Set the throttle to "fast idle":
 - First, depress the throttle lock lever (#1).
 - Squeeze the throttle trigger (#2).
 - Depress the throttle lock slide switch (#3) toward the lock lever, and release the throttle lever.



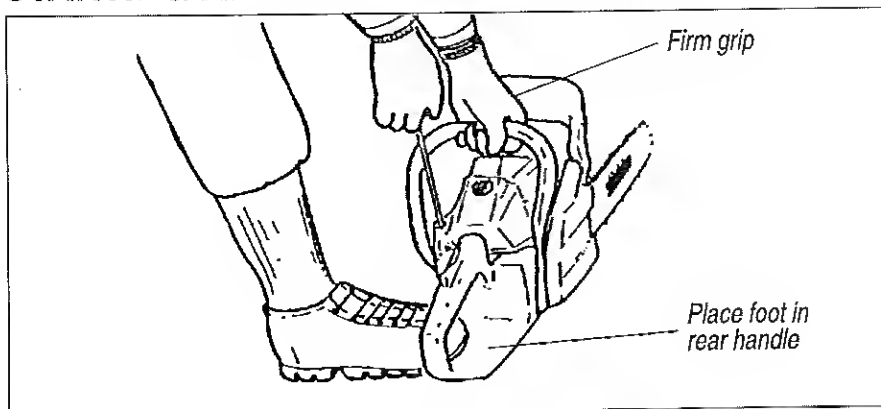
Control Positions (warm engine):

1. Move the ignition switch to the "I" (ON) position.
2. Choke control should be all the way in (choke is open).
3. Set the throttle to "fast idle" (as above).

IMPORTANT!

The throttle lever cannot be moved without first depressing the lock lever.

STARTING AND STOPPING THE SAW



1. Place the saw on the ground.
2. Secure the saw by placing your right foot inside the rear handle and your left hand firmly on the front handle as shown.
3. Grip the starter handle with your right hand. Pull the starter cord slowly until you feel the starting mechanism engage, then...
4. Start the saw by pulling the starter cord upward rapidly.



CAUTION!

The recoil starter can be damaged by abuse!

- Never pull the starter cord to its full length.
- Always engage the starter before cranking the engine!
Always rewind the starter cord slowly.



WARNING!

The saw chain will turn as the engine accelerates!

4. Operating the throttle will automatically disengage the "fast-idle" setting.

If the engine does not start:

Repeat the appropriate starting procedures for "hot" or "cold" engine. If the engine still will not start, follow the "Starting a Flooded Engine" procedure on the following page.

Stopping:

Turn switch "OFF" after idling at low speed for 1 to 2 minutes.

When the engine fires:

1. Push the choke control "in" to its original position (choke is open).
2. If the engine did not continue to run, pull the recoil again.
3. As the engine starts, clear excess fuel from the combustion area by revving the engine several times.

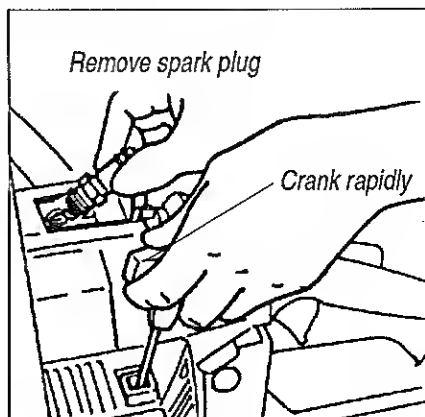
STARTING A FLOODED ENGINE

1. Remove the air filter cover, disconnect the spark plug lead, and use the spark plug wrench to remove the spark plug in a counter-clockwise direction.

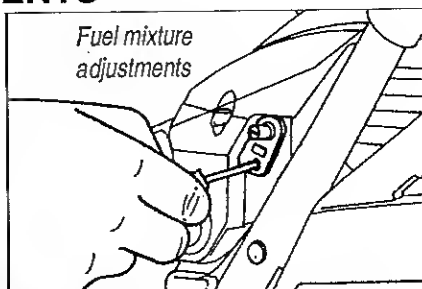
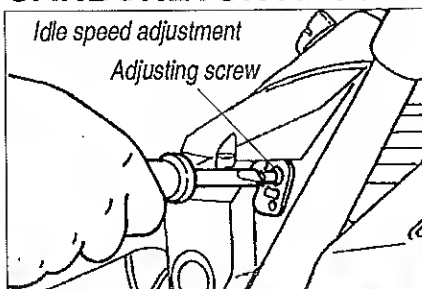
NOTE:

Access to 488 spark plug requires removing air filter cover.

2. If the spark plug is fouled or soaked with fuel, clean or replace as required. For correct spark plug size and gapping procedure, (see page 24).
3. Clear excess fuel from the combustion chamber by cranking the engine several times while the spark plug is removed.
4. Replace the spark plug, and then reconnect the spark plug lead.
5. Repeat the starting procedures for "warm engine."
6. If the engine still fails to fire or start, refer to the troubleshooting chart at the end of this manual.



CARBURETOR ADJUSTMENTS



IMPORTANT!

Before attempting any carburetor adjustments, inspect and clean the engine air filter as described on page 23 of this manual.

Before starting the saw

1. Inspect saw chain tension, and adjust if necessary. (see page 10)
2. Verify that the chain brake is disengaged, and that the saw chain is free to rotate.

Start the saw

Start the saw and warm the engine to operating temperature. Place the saw on the ground, and adjust the carburetor as follows:

Idle speed adjustment

Use a screwdriver to slowly turn the idle speed adjusting screw in or out until the engine idles smoothly at 2600-3000 rpm.



WARNING!

The saw chain must never rotate at engine idle speed!

Low Speed (L) and High Speed (H) Adjustment-Standard opening:

- (1) EPA only
L...0~1/4 turns
- (2) EMC only
L...1-1/4±1/4
H...1-1/4±1/4

EPA only

Low Speed Mixture (engine idling; at operating temperature)

1. Using a small screwdriver, slowly turn the idle mixture screw clockwise (lean mixture), and note any changes in engine rpm.
2. Next, turn the idle mixture screw counter-clockwise (rich mixture) and note any changes in engine rpm.
3. Adjust the idle mixture screw to provide the smoothest possible idle with no sacrifice in acceleration.
4. If necessary, readjust the idle speed screw for an engine idle speed of 2600-3000 rpm.

High Speed Mixture

High-speed mixture for the 488 saw is factory-set, and cannot be adjusted in the field.

EMC only

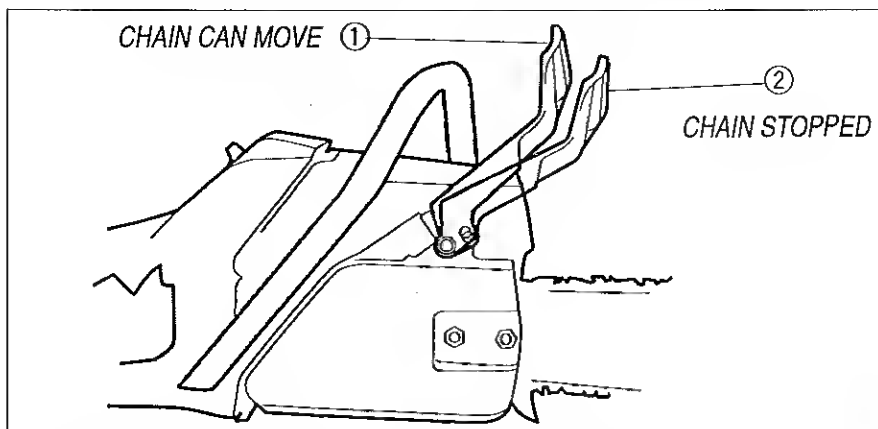
Adjustments for Low Speed (L) Adjusting Screw-

After adjusting the low speed screw according to the number shown above, continue to turn gently either to right or to left so that engine rotation may be accelerated. Continuing to turn will result in engine rpm decrease. Return to the position just before this slow-down and set at this point. If necessary readjust the idle speed screw for an engine idle speed of 2600-3000 rpm.

High Speed (H) Adjustment-

No adjustment is necessary when the saw is new. After approximately 10 hours use, rotate the H-needle clockwise to 1-1/4 turns (±1/4 turns).

CHAIN BRAKE OPERATION AND SERVICE



Chain Brake Operation

This saw is equipped with a chain brake designed to stop the saw chain from rotating whenever the brake lever is moved to the forward (#2) position.

- Engaging the brake lever causes a brake band to tighten around the clutch drum, stopping the saw chain.
- The chain brake is designed to engage whenever the brake lever strikes the operator's hand.
- The chain brake can also be activated by pushing the brake lever forward manually.

To release (disengage) the chain brake, pull the brake lever toward you (position #1).



WARNING!

The chain brake is installed only to reduce the risk of kickback! The chain brake is not a substitute for careful operation!

IMPORTANT!

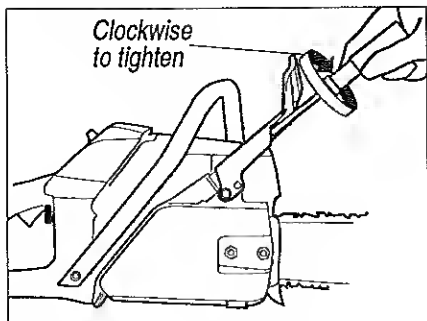
Release the throttle whenever the chain brake is activated!

Chain Brake Inspection (engine "off")

Before inspecting the chain brake, stop the saw and remove the clutch cover and clean any dirt or debris from the chain brake mechanism. Reassemble the clutch cover to the saw, and use the following procedure to test for proper adjustment:

1. Turn the engine "off", and verify that the ignition switch is in the "O" or "off" position.
2. Engage the chain brake by manually pushing the brake lever forward to position #2 (brake is engaged).
3. While wearing heavy gloves, attempt to rotate the saw chain:
 - Grasp the chain behind one of the cutters.
 - Attempt to push the chain around the bar.
4. If the chain cannot be rotated, no further adjustment is required. If any chain movement is possible, go to "Adjustment" (next page).

CHAIN BRAKE OPERATION AND SERVICE



Adjustment

1. Disengage the chain brake (position #1). Use a screwdriver to tighten the chain brake adjusting screw 2-4 turns in a clockwise rotation.
2. Repeat steps 1-4, and readjust as necessary until the chain cannot be rotated while the brake lever is in the #2 (engaged) position.
3. Start and briefly accelerate the saw to verify that the saw chain will not rotate when the brake lever is moved to the #2 position.



WARNING!

The above testing procedure must cause the chain brake to engage and stop the saw chain! If the chain brake does not fully engage and stop the saw chain during this test, **DO NOT OPERATE THE SAW!** Return the saw to your dealer for repairs!



WARNING!

Never attempt to adjust the chain brake while the engine is running!

Chain Brake Maintenance

- Keep the brake mechanism clean and free of sawdust or debris.
- If the chain brake becomes damaged or worn, or fails to completely engage or release the clutch drum, return the saw to your dealer for repairs.



CAUTION!

Never start or operate this saw while the chain brake is activated!

- Never carry the saw by the brake lever! Carry the saw by the front handle.
- Always stop the saw and disengage the chain brake before removing or replacing the clutch cover!
- Never make carburetor adjustments while the chain brake is engaged!

CUTTING WITH THE SAW

IMPORTANT!

Always use full throttle while cutting! Keep the chain sharp and let the saw do the work! Forcing the saw into the work reduces cutting performance, and can damage the saw through overheating!



THINK SAFETY!

- Clear a safe work area before cutting.

- Stop the saw before moving it to or from the work area.

- Wear eye protection such as a face shield or goggles during cutting.

- Always wear gloves when operating this saw.

- Use full-throttle while cutting, and apply only enough bar pressure to maintain engine speeds of 9000-10,000rpm.



- Wear close-fitting clothing to protect your legs and arms. Do not wear clothing or jewelry that could get caught in machinery or brush.

- Wear appropriate non-skid footwear.

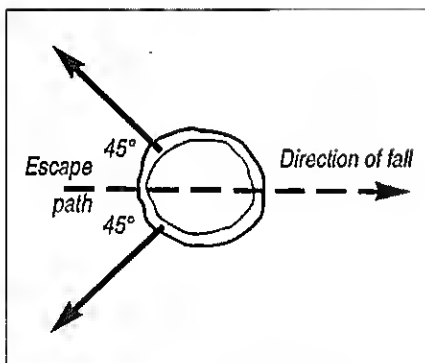
- Keep a proper footing (do not overreach)!

- Never operate with a loose saw chain!
- Never operate the saw if fastenings are loose or missing!
- Never operate the saw if any component parts are damaged, loose, or missing!

FELLING TREES

Before Felling a Tree

1. Determine the direction of fall by inspecting:
 - Tree shape and angle of lean.
 - Size and shape/placement of limbs.
 - Location of nearby trees or other obstacles.
 - Condition of tree (damage, disease, etc.).
 - Prevailing wind direction.
2. Clear a safe work area around the tree. Be alert for loose or dead limbs overhead. Clear an appropriate escape path approx. 45° from the direction of fall.



3. Notify nearby workers of your intentions!

Felling Small Trees (Under 6" diameter)

1. Determine the direction of fall. If uncertain as to direction of fall, use the procedure "Felling Large Trees" as outlined on the following page.
2. Start cutting on the side of the tree away from the fall, and make a single felling cut all the way through the tree.
3. Stop the saw, and put it down on the ground.
4. Use your retreat path to exit the area quickly.



WARNING!

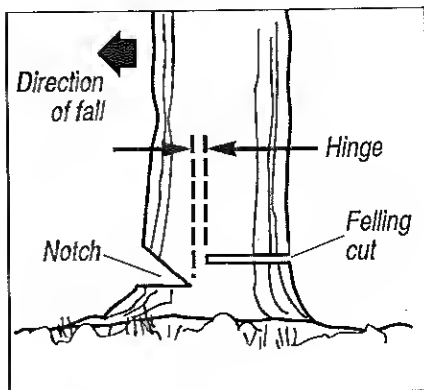
Diseased, damaged, or otherwise unbalanced trees can fall unpredictably during felling, and should be left to an experienced timber feller!

FELLING TREES

Felling Larger Trees (Over 6" diameter)

If a tree is otherwise healthy and not seriously out of balance, its direction of fall can often be encouraged by first "notching" the tree on the side facing the desired direction of fall.

After the notch is completed, start the felling cut slightly higher and on the opposite side of the tree, away from the direction of fall.



The goal of this method is to leave a sturdy wooden "hinge" for the tree to pivot on while falling.

1. Determine the direction of fall.
2. On the side of the tree facing the direction of fall, make a single 90° cut through approx. 1/3 of the tree's diameter.
3. Working from the same side of the tree and at a 45° angle to the first cut, make a second cut to remove a notch from the tree as shown.
4. Working on the opposite side of the tree and starting approximately 2" higher than the bottom of the notch created in steps 1-3, make the final felling cut shown.



WARNING!

Failure to leave a proper wooden hinge during the falling or "back cut" can cause the tree to pinch the saw's guide bar, and may also change the direction of fall!



WARNING!

Always make your falling cut parallel to the bottom cut! An angled falling cut may cause the tree to split, possibly changing the direction of fall!

NOTE:

If the cut appears to be closing on the bar, use a mallet to drive one or two plastic or wooden wedges into the cut behind the bar.

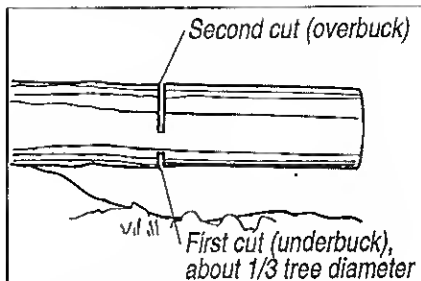
5. Stop the saw, and put it down.
6. Use your retreat path to exit the area quickly.

BUCKING

Techniques

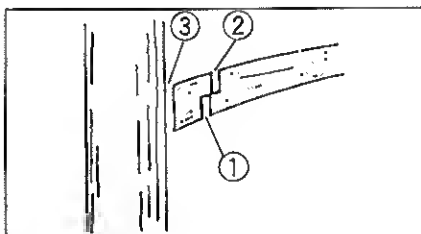
- If the log is well supported, start your cut from the top of the log. Keeping the guide bar parallel to the ground, cut straight down but do not allow the saw to cut into the ground.
 - Cutting downed timber, or "bucking", increases the possibility of the wood setting and pinching the guide bar. Driving one or more soft plastic or wooden bucking wedges can help prevent bar-pinching during a cut.
 - Use two cuts when bucking near the inboard end of an unsupported log.
1. Make the first cut as an overbuck approx. 1/3 the diameter of the log.
 2. Finish the job with an underbuck coming up from beneath and joining the first cut.

- Use two cuts when bucking the out-board end of an unsupported log. Your first cut should be an underbuck, cut-ting upward through approximately 1/3 the diameter of the tree. Finally, move to the top of the log and finish the cut by bucking down (overbucking) to your first cut.



LIMBING

Limbing a standing tree is usually accomplished in the same manner as bucking, with a third and final cut used to remove the remaining stub of the limb.



WARNING!

Always cut downed timber from the uphill side of the wood! Be alert for potential injury from rolling or shifting logs! Downed timber may shift or roll unpredictably during cutting or handling operations!



WARNING!

Kickback danger increases in over-height or out of position cutting! Do not overreach, or attempt to cut above shoulder height!

NOTE:

When cutting unsupported logs or limbs, starting with an underbuck cut will minimize the possibility of the wood splitting during the bucking cut.

ROUTINE MAINTENANCE

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A DEALER OR SERVICE CENTER AUTHORIZED BY SHIN-DAIWA KOGYO CO., LTD. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

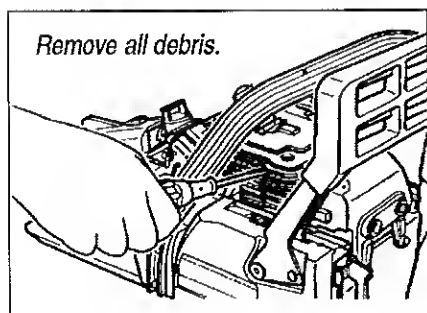


WARNING!

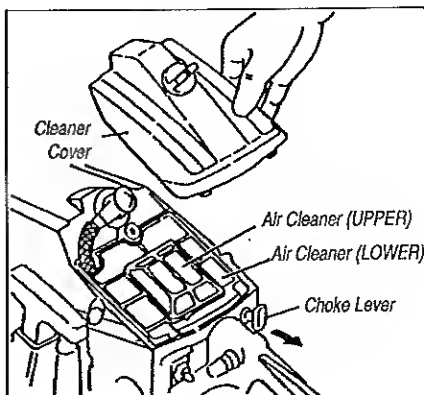
Before performing any maintenance on this saw, stop the engine and disconnect the spark plug wire!

Daily Maintenance

1. Remove dirt and debris from the saw exterior, cylinder fins, and cooling air intake.



2. Inspect the saw for fuel and oil leaks, and repair as necessary.



3. Service the air filter

- Remove the air cleaner, being careful not to drop dust in the carburetor. Make sure the choke lever is pulled when removing the air cleaner. Dust tends to accumulate on the bottom surface. Rinse the air cleaner with gasoline or solvent. When blowing with air, blow from the upper side.
- Working in the reverse order of disassembly re-assemble the air filter elements and cover to the saw.

4. Sharpen and adjust the saw chain as required.

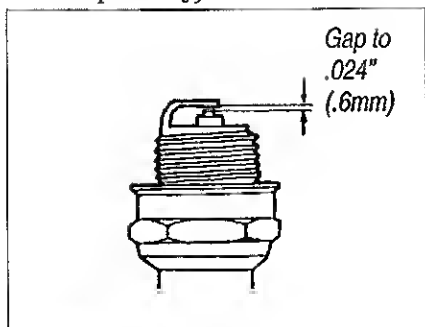
5. Clean the guide bar groove and oil hole, and inspect the bar groove and tip for damage or unusual wear. Repair or replace worn or damaged components as necessary.

6. Inspect the entire saw for damaged, loose or missing components or fastenings, and repair as necessary.

10/15 HOUR MAINTENANCE

1. Remove and clean the spark plug. Adjust the spark plug gap to 0.024" (0.6mm), and reinstall. Replace any damaged or visibly worn plug with a Champion CJ6Y or NGK BPMR7A* or equivalent.

*Resistor spark plug required for EMC (electromagnetic compatibility).



CAUTION!

Never allow chips or other debris to enter the cylinder bore! Before removing the spark plug, thoroughly clean the spark plug and cylinder head area!

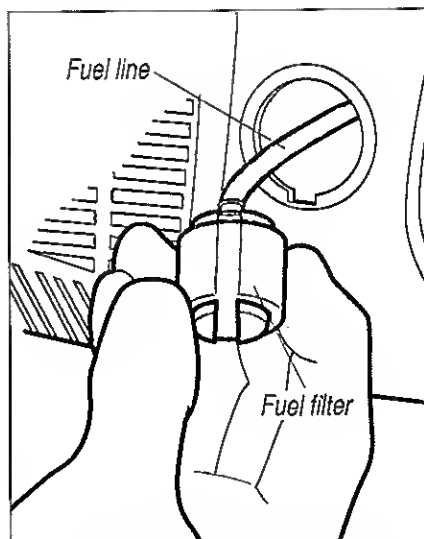
2. Remove the guide bar and chain. Carefully inspect the drive sprocket for wear or damage, and replace if noted. Inspect the guide bar grooves and tip for wear or damage, and repair or replace components as required.

IMPORTANT!

The drive sprocket and saw chain loop should always be replaced as a set! For economy, rotate the same 2-3 chains daily. When these chains are worn out, replace both the chains and drive sprocket at the same time.

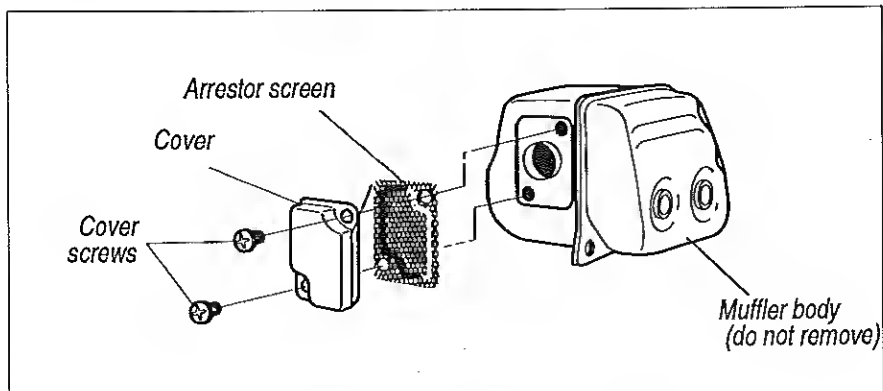
40/50 HOUR MAINTENANCE

1. Replace the spark plug with a Champion CJ6Y or NGK BPMR7A* (or equivalent), gapped to 0.024" (0.6mm).
2. Extract the fuel filter from inside the fuel tank, and then remove and wash the filter element in clean fuel. Before reinstalling the filter, inspect the condition of the fuel line. If damage or deterioration are noted, the saw must be removed from service until it can be inspected by a Shindaiwa-trained service technician.



3. Extract the oil filter from inside the oil tank, and then wash the filter element in clean fuel as above. If damage or deterioration are noted on the oil suction line, the saw must be removed from service until it can be inspected by a Shindaiwa-trained service technician.

SPARK ARRESTOR MAINTENANCE



Hard starting or a gradual loss of performance can be caused by carbon deposits lodged in the muffler's spark arrestor screen. For maximum performance, the arrestor screen should be periodically removed and cleaned with a small wire brush.

- **CAUTION!** Carbon deposits in the combustion chamber or exhaust port cannot be removed in the field. For further decarbonization, return the 488 to your Shindaiwa dealer.

LONG TERM STORAGE

(over 30 days)

- Thoroughly clean the saw exterior.
- Remove all chips and other debris from the cylinder fins and cooling passages.
- Drain the fuel tank, and then clear the carburetor and lines by running the saw until it stops from lack of fuel.



CAUTION!

Never store the saw with any fuel remaining in the tank, fuel lines, or carburetor! Your Shindaiwa warranty does not include coverage for damage caused by "stale" or contaminated fuels!

- Drain any remaining bar oil from the oil reservoir.
- Remove the spark plug, and then pour $\approx 1/4$ -oz of oil into the cylinder through the spark plug hole. Before reinstalling the spark plug, slowly pull the recoil starter 2-3 times to distribute the oil over the cylinder walls.
- Remove, clean, and reinstall the air filter element as described under "daily maintenance."
- Repair or replace any damaged components as required, and then store the machine in a clean, dry, dust-free area.

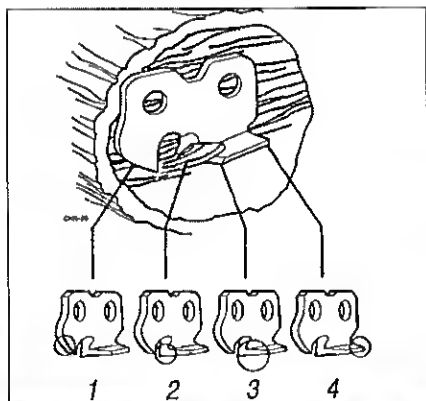
SAW CHAIN PERFORMANCE

Your saw's performance on the job depends heavily on the condition of its saw chain.

How the saw chain works

As the saw chain is pulled through the wood:

1. The depth gauge setting determines the depth of cut for each cutter.
2. The cutter's leading edge enters the wood, causing the entire cutter to "rock back" and lift away from the bar.
3. The top plate peels the severed wood chip away.
4. The chip is discharged out the rear of the cutter.



IMPORTANT!

Most of the actual cutting is done by the sides and corners of the individual cutters!

Sharpening Technique

1. Using the appropriate round file, sharpen all cutters to a 25° angle as shown.

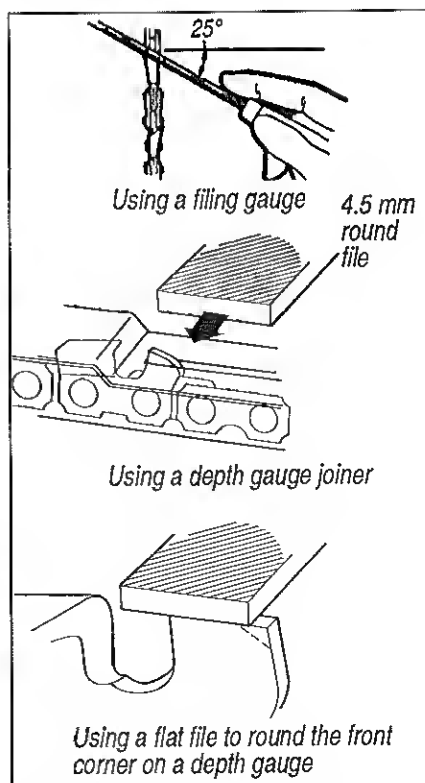
IMPORTANT!

File all cutters to the same angle and depth! Unequal filing may cause the saw to vibrate or cut erratically!

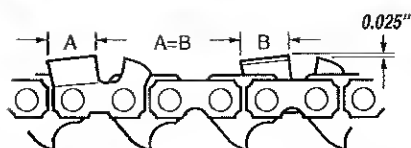
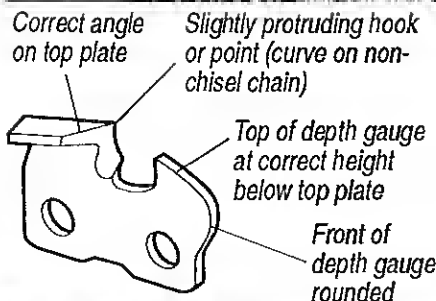
NOTE:

For consistent filing angles, use a filing guide such as Oregon® p/n 31692 or equivalent.

2. After all cutters are sharpened, use a depth gauge joiner (Oregon® p/n 22290 or equivalent) to measure the height of each depth gauge.
3. As required, use a flat file to lower depth gauges to the appropriate .025" (0.635 mm) height.
4. After all depth gauges have been adjusted, use a flat file to round each depth gauge leading edge to original curvature and angle.



Correct Filing Technique



Keep all cutter lengths equal

Filing Problems

Top plate angle less than recommended



Cause

File held at less than recommended angle.

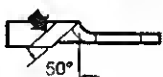
Result

Slow cutting. Requires extra effort to cut.

Remedy

File cutters to recommended angle.

Top plate angle more than recommended



Cause

File held at more than recommended angle.

Result

Cutting angle is very sharp but will dull fast. Cutting action rough and erratic.

Remedy

File cutters to recommended angle.

Hook in side plate cutting edge



Cause

File held too low or the file was too small.

Result

Rough cutting. Chain grabs. Cutters dull quickly or won't hold a cutting edge.

Remedy

Check file size. File cutters to recommended angle.

Backslope on side plate cutting edge.



Cause

File held too high or the file was too large.

Result

Cutters won't feed into wood. Slow cutting. Must force chain to cut. Causes excessive bottom wear.

Remedy

File cutters at recommended angle. Check file size.

High depth gauge



Cause

Depth gauge never filed.

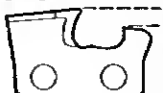
Result

Slow cutting. Must force chain to cut. Will cause excessive wear on the cutter heel.

Remedy

Lower gauges to recommended setting.

Low depth gauge



Cause

Wrong gauge setting or no gauge used.

Result

Rough cutting. Chain grabs. Saw won't pull chain through wood. Excessive wear on the cutter heel.

Remedy

If depth gauges are too low, the chain is no longer serviceable.

TROUBLESHOOTING

ENGINE DOES NOT START

What to check		Possible cause	Remedy
Does the engine crank?	NO	Faulty recoil starter. Fluid in the crankcase. Internal damage.	Return saw to dealer.
YES			
Good compression?	NO	Loose spark plug. Excess wear on cylinder, piston, rings.	Tighten and re-test. Return saw to dealer.
YES			
Does the tank contain fresh fuel of the proper grade?	NO	Stale or contaminated fuel mixture.	Drain and re-fill with fresh fuel of the correct mixture (Gasoline and Shindaiwa Premium 2-cycle Engine Oil, 40:1 ratio).
YES			
Is fuel reaching the cylinder and combustion chamber?	NO	Check for clogged fuel filter and/or vent.	Clean as required and re-start.
YES			
Is there spark at the spark plug wire terminal?	NO	Is the ignition switch ON? Faulty ignition ground. Faulty transistor unit.	Move switch to ON and re-start. Return saw to dealer.
YES			
Check the spark plug	NO	If the plug is wet, excess fuel may be in the cylinder. The plug may be fouled or improperly gapped. The plug may be damaged internally or may be the wrong size.	Crank the engine with the plug removed, replace the plug, and re-start. Clean and re-gap the plug to 0.024 inch (0.6mm). Re-start. Replace the plug with a Champion CJ6Y. (NGK BPMR7A for 488 EMC) Re-start.

TROUBLESHOOTING

LOW POWER OUTPUT

What to check	Possible cause	Remedy
Is the engine overheating?	Operator is overworking the machine.	Cut at a slower rate. Sharpen chain as required.
	Carburetor mixture is too lean.	Return saw to dealer.
	Improper fuel ratio.	Re-fill with fresh fuel of the correct mixture (Shindaiwa Premium 2-cycle Engine Oil and gasoline — 40:1 ratio. (Refer to page 11, "Fuels")
	Fan, fan cover, cylinder fins dirty or damaged.	Clean, repair or replace as necessary.
	Carbon deposits on piston or in the muffler.	Decarbonize.
Engine is rough at all speeds. May also have black smoke and/or unburned fuel at the exhaust.	Clogged air cleaner.	Service the air cleaner.
	Loose or damaged spark plug.	Tighten or replace.
	Air leakage or clogged fuel line.	Repair or replace fuel filter and/or fuel line.
	Water in the fuel.	Replace the fuel.
	Piston seizure.	Return saw to dealer.
	Faulty carburetor and/or diaphragm.	Return saw to dealer.
Engine is knocking.	Overheating condition.	See above.
	Improper fuel.	Check fuel octane rating; check for presence of alcohol in the fuel. Refuel as necessary.
	Carbon deposits in the combustion chamber.	Decarbonize. (return to dealer)

TROUBLESHOOTING

ADDITIONAL PROBLEMS

Symptom	Possible cause	Remedy
<div>Poor acceleration</div>	Clogged air cleaner.	Clean the air cleaner element.
	Clogged fuel filter.	Replace the fuel filter.
	Chain brake engaged.	Inspect and/or adjust brake. Return to dealer as required.
	Carburetor mixture too rich or too lean.	Return saw to dealer.
	Idle speed set too low.	Adjust: 2600-3000 RPM.
<div>Engine stops abruptly.</div>	Switch turned off.	Set the switch to ("ON") and re-start.
	Fuel tank empty.	Refuel.
	Clogged fuel filter.	Clean or replace filter as required.
	Water in the fuel.	Drain; replace with clean fuel.
	Shorted spark plug or loose terminal.	Clean or replace spark plug. Tighten the terminal.
	Ignition failure.	Replace the ignition unit.
	Piston seizure.	Return saw to dealer.
<div>Engine difficult to shut off.</div>	Ground (stop) wire is disconnected, or switch is defective.	Test and replace as required.
	Overheating due to incorrect spark plug.	Correct plug: Champion CJ6Y.
	Overheated engine.	Idle engine until cool.
<div>Chain rotates at idle speed.</div>	Engine idle too fast.	Set idle: 2600-3000 RPM.
	Broken clutch spring or shoe.	Replace spring/shoes as required.
<div>Excessive vibration.</div>	Worn or damaged sprocket, chain or bar.	Inspect and replace chain components as required.
	Bent crankshaft.	Return saw to dealer.

Shin-Daiwa Kogyo Co., Ltd.
Federal Emission Design And Defect Limited Warranty
Utility And Lawn And Garden Engines

Shin-Daiwa Kogyo Co., Ltd. warrants to the initial purchaser and each subsequent owner, that this utility equipment engine (herein engine) is designed, built and equipped to conform at the time of initial sale, to all applicable regulations of the U.S. Environmental Protection Agency (EPA), and that the engine is free of defects in materials and workmanship that would cause this engine to fail to conform with EPA regulations during its warranty period. This emission warranty is applicable in all States, except the State of California.

For parts listed under PARTS COVERED, the dealer authorized by Shin-Daiwa Kogyo Co., Ltd. will, at no cost to you, make the necessary diagnosis, repair, or replacement of any defective emission-related component necessary to ensure that the engine complies with applicable U.S. EPA regulations.

**MANUFACTURERS WARRANTY
COVERAGE**

When sold within the U.S., this engine's emission control system is warranted for a period of two (2) years from the date this product is first delivered to the original retail purchaser.

**OWNER'S WARRANTY
RESPONSIBILITIES**

As the engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. Shin-Daiwa Kogyo Co., Ltd. recommends that you retain all receipts covering maintenance on your engine, but Shin-Daiwa Kogyo Co., Ltd. cannot deny a warranty claim solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the engine owner, you should

however be aware that Shin-Daiwa Kogyo Co., Ltd. may deny your warranty coverage if your engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your engine to the nearest dealer authorized by Shin-Daiwa Kogyo Co., Ltd. when a problem exists.

If your Shindaiwa Dealer is unable to answer questions regarding your warranty rights and responsibilities, you should then contact your Shindaiwa Distributor.

For the name and telephone number of the Shindaiwa Distributor in your area, please call Shindaiwa Inc. at (603) 692-3070 between the hours of 8:00 AM and 5:00 PM Pacific Standard Time.

PARTS COVERED

Listed below are the parts covered by the Federal Emission Design and Defect Warranty. Some parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part. The warranted parts include:

1. Carburetor Internal Components
 - Jet, Diaphragm Assembly-Metering
2. Ignition System Components
 - Ignition Coil
 - Flywheel Rotor

The emission control system for your particular Shindaiwa engine may also include certain related hoses and connectors.

LIMITATIONS

The Federal Emission Design and Defect Warranty shall not cover any of the following:

- (a) conditions resulting from tampering, misuse, improper adjustment (unless they were made by the dealer or service

center authorized by Shin-Daiwa Kogyo Co., Ltd. during a warranty repair), alteration, accident, failure to use the recommended fuel and oil, or not performing required maintenance services,

- (b) the replacement parts used for required maintenance services,
- (c) consequential parts used for required maintenance services,
- (d) diagnosis and inspection fees that do not result in eligible warranty service being performed, and
- (e) any non authorized replacement part, or malfunction of authorized parts due to use of non authorized parts.

MAINTENANCE AND REPAIR REQUIREMENTS

You are responsible for the proper use and maintenance of the engine. You should keep all receipts and maintenance records covering the performance of regular maintenance in the event questions arise. These receipts and maintenance records should be transferred to each subsequent owner of the engine. Shin-Daiwa Kogyo Co., Ltd. reserves the right to deny warranty coverage if the owner has not properly maintained the engine. Shin-Daiwa Kogyo Co., Ltd. will not deny warranty repairs, however, solely because of the lack of repair maintenance or failure to keep maintenance records.

MAINTENANCE, REPLACEMENT OR REPAIR OF EMISSION CONTROL DEVICES AND SYSTEMS MAY BE PERFORMED BY ANY REPAIR ESTABLISHMENT OR INDIVIDUAL; HOWEVER, WARRANTY REPAIRS MUST BE PERFORMED BY A DEALER OR SERVICE CENTER AUTHORIZED BY SHIN-DAIWA KOGYO CO., LTD. THE USE OF PARTS THAT ARE NOT EQUIVALENT IN PERFORMANCE AND DURABILITY TO AUTHORIZED PARTS

MAY IMPAIR THE EFFECTIVENESS OF THE EMISSION CONTROL SYSTEM AND MAY HAVE A BEARING ON THE OUTCOME OF A WARRANTY CLAIM.

If other than the parts authorized by Shin-Daiwa Kogyo Co., Ltd. are used for maintenance replacements or for the repair of components affecting emission control, you should assure yourself that such parts are warranted by their manufacturer to be equivalent to the parts authorized by Shin-Daiwa Kogyo Co., Ltd. in their performance and durability.

OBTAINING WARRANTY SERVICE

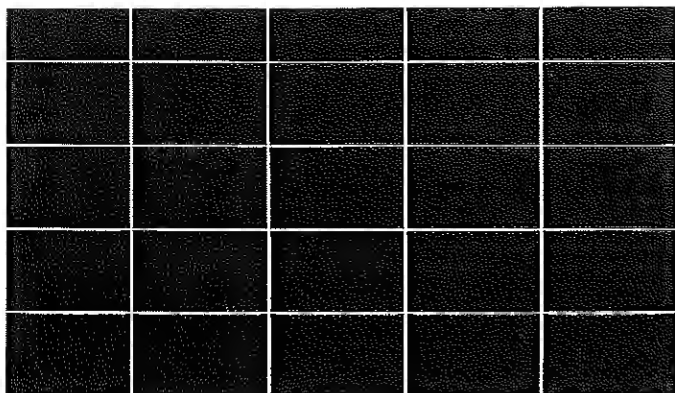
All repairs qualifying under this limited warranty must be performed by a dealer authorized by Shin-Daiwa Kogyo Co., Ltd.

If any emission-related part is found defective during the warranty period, it is your responsibility to present the product to an authorized Shindaiwa Dealer. Bring your sales receipts showing the date of purchase for this engine. The dealer authorized by Shin-Daiwa Kogyo Co., Ltd. will perform the necessary repairs or adjustments within a reasonable amount of time and furnish you with a copy of the repair order. All parts and accessories replaced under this warranty become the property of Shin-Daiwa Kogyo Co., Ltd.

To locate an authorized Shindaiwa Dealer nearest you, contact your Shindaiwa Distributor. For the name and telephone number of the Shindaiwa Distributor in your area, please call Shindaiwa Inc. at (503) 692-3070 between the hours of 8:00 AM and 5:00 PM Pacific Standard Time.

THIS WARRANTY IS ADMINISTERED BY:

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Tualatin, OR. 97062
(503) 692-3070



shindaiwa

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Printed in Japan

P/N 72385-93112